

OBSERVATIONS ON THE LIFE HISTORY OF *NEOSCHÖNGASTIA*
KALLIPYGOS GUNTHER 1939.
 (ACARINA: TROMBIDIIDAE.)

By CARL E. M. GUNTHER, M.B., B.S., D.T.M. (Sydney), Field Medical Officer,
 Bulolo Gold Dredging Limited, Bulolo, Territory of New Guinea.

(Two Text-figures.)

[Read 27th September, 1939.]

NEOSCHÖNGASTIA BIPYGALIS, nom. nov.

N. kallipygos Gunther, PROC. LINN. SOC. N. S. WALES, lxiv, 1939, 83.

Owing to the regrettable use of the specific name *kallipygos* by Derrick, Smith, Brown and Freeman (1939), before the species was described, a change of name becomes necessary.

Life History.—As far as is known the life history of the trombidiid mites is as follows:

According to Patton and Evans (1929) it is likely that the eggs are laid singly in the ground.

The larvae are mostly parasitic on birds and mammals—the genus *Hannemania* is confined to frogs. When ready for metamorphosis the larvae bury themselves in the ground (this has been observed for *Trombicula akamushi*, *Leptus autumnalis*, and *Trombicula minor*).

The nymph is reported to be parasitic on other arthropods, although there is a possibility that it is a vegetable feeder.

The adult is supposed to live in decaying vegetable matter on the forest floor, or in the sand and silt left by floods, and by assumption (Hirst, 1926), in the nests of field mice.

Nowhere is there any mention of the adult or nymph being parasitic on either birds or mammals, nor is there any record of ova being found cemented to fur or feathers in the manner of louse ova.

The larvae of *Neoschöngastia bipygalis* occur in New Guinea as parasites on the following hosts: The brown bush rat (*Rattus ringens*), Brown's rat (*Rattus browni*), Monckton's melomys (*Melomys moncktoni*), Stalker's melomys (*Melomys stalkerii*), the rufous melomys (*Melomys ruber*), an arboreal "mouse" (*Melomys* sp.), Bandicoot (*Echymipera cockerelli*), and Bandicoot (*Peroryctes rufirayana*).

On the first five of these it can be found in large numbers embedded around the mammae, or in the penis, and on the bare parts of the hind legs; specimens have also been taken running free in the fur. From the other three hosts only a few specimens have been taken. It seems likely that the rats are the principal hosts, the others being only casual hosts.

On each of the five principal hosts are to be found many ova cemented to the abdominal hairs. Some are undifferentiated, but in those in late stages of development the details of the contained larvae can clearly be seen through the shell.

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On the first five of these it can be found in large numbers embedded around the mammae, or in the penis, and on the bare parts of the hind legs; specimens have also been taken running free in the fur. From the other three hosts only a few specimens have been taken. It seems likely that the rats are the principal hosts, the others being only casual hosts.

On each of the five principal hosts are to be found many ova cemented to the abdominal hairs. Some are undifferentiated, but in those in late stages of development the details of the contained larvae can clearly be seen through the shell.

They show the characteristic scutum, first tarsi, dorsal setae, chelicerae, and caudal plates of the normal larva, *Neoschöngastia bipygalis* (Fig. 1, which is the illustration of this larva from my detailed description, and Fig. 2b).

There is no possibility that these ova may have been laid in the nests of the rats, and have become entangled in their fur, for they are definitely cemented to bundles of 5 to 10 hairs at their bases, and the larva lies always in the same relative position in the ovum.

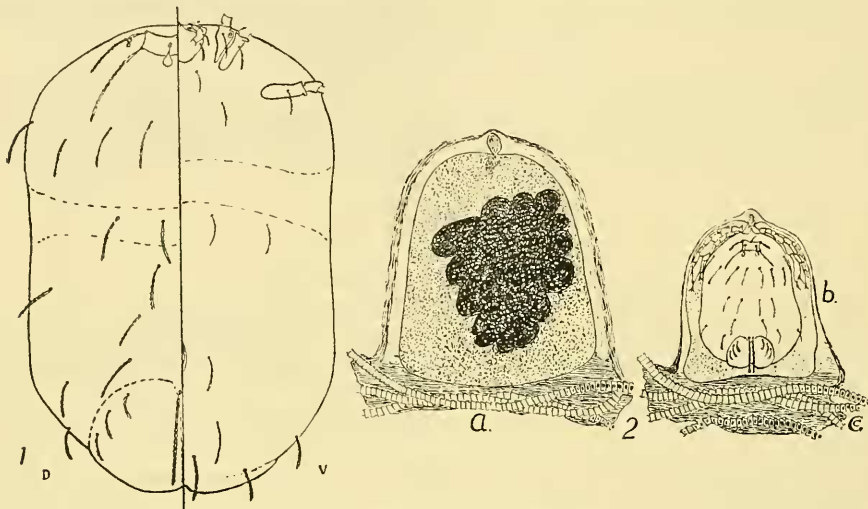


Fig. 1.—Larva of *N. bipygalis*.

Fig. 2.—a, Undifferentiated ovum; b, Ovum in late stage, showing contained larva.

The adult female must certainly be a parasite of these hosts for as long as it takes her to deposit her eggs. Nothing further can be assumed positively, but the possibilities are:

1. That the adults live in the nests of these rats, and that the ovigerous females deposit their eggs while the rats are sleeping. If this be so, then investigation of nests should result in specimens of adults being taken.

2. That the ovigerous female is a normal parasite of the rats—which would demand that it resembles, for instance, one or other of the two suborders of lice—and that it lives either by sucking or by biting. In this case, adults should be found on the rats.

In view of the fact that nobody knows what the adults of the larval genus *Neoschöngastia* look like, the question is not likely to be settled until the nymph at least can be bred, although the finding of an ovigerous female bearing an ovum of the typical shape and size would be conclusive.

I have tried with ten larvae to breed nymphs, using the technique which was successful with *Trombicula minor*, but the larvae neither buried themselves in the soil nor made any considerable efforts to crawl around; they just died.

So far I have been unable to obtain any rats' nests, nor have I found any promising adults on rats. For the present, therefore, all that can be done is to describe the ova, and point out that their presence on the abdominal hairs of various rats indicates for this species a radical variation from what we know of the normal life history of the Trombicidiidae.

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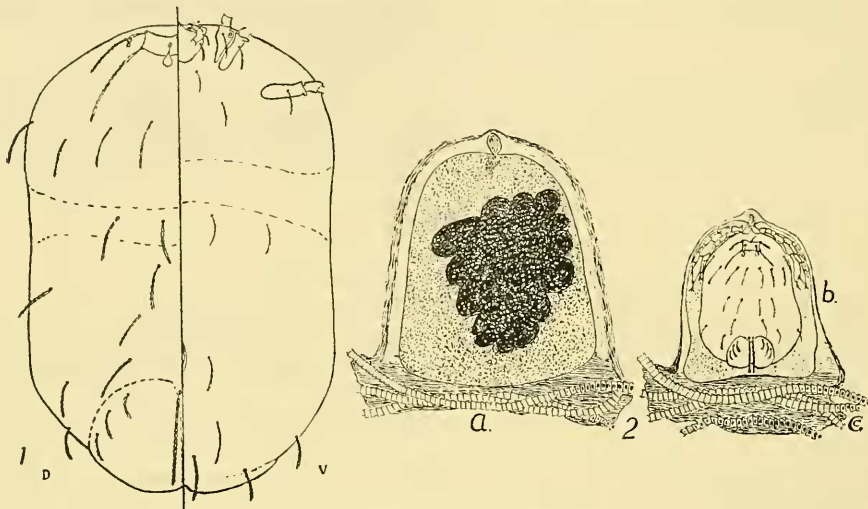


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OVUM (Figures 2a, b).

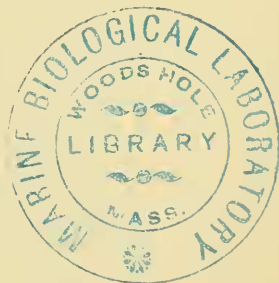
Location: Found cemented to the abdominal hairs of various New Guinea rats: *Rattus ringens*, *R. browni*, *Melomys moncktoni*, *M. stalkeri*, and *M. rubex*. Colour a dirty yellow to light brown. Bell-shaped, cemented to the hairs at its base. The walls consisting of a lining layer, a clear centre, and an outer laminated layer. The apex produced into a small conical tubercle. The larva lying with its head away from the base, its chelicerae projecting into the conical tubercle. The undifferentiated ovum is larger, with thick walls. As the larva matures the shell shrinks and becomes thinner, the latter mainly due to shedding of the outer laminated layer. Average measurements: Height, early, 541μ ; mature, 380μ . Width at base: early, 508μ ; mature, 370μ . Width across equator: early, 412μ ; mature, 270μ . Thickness of shell: early, 141μ ; mature, 70μ .

Acknowledgement.

Mr. H. Womersley, A.L.S., F.R.E.S., has been so kind as to check this paper for me.

References.

- DERRICK, SMITH, BROWN and FREEMAN, 1939.—*Med. Journ. Aust.*, 28 January, 150.
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